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IN THE APPLICATION

OF

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AND

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FOR

**WATERTIGHT DECKING**

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# WATERTIGHT DECKING

## BACKGROUND OF THE INVENTION

### 1. FIELD OF THE INVENTION

The present invention relates generally to extruded panels, and more particularly to a series of panel extrusions configured to interlock tightly and immovably with one another, and also to preclude moisture passage through the joints between panels. The present watertight decking may be installed as a deck or similar surface over a room, storage area, or other space which must be kept dry, and thereby serves dual purposes as flooring and as a waterproof roof structure over the underlying area.

### 2. DESCRIPTION OF THE RELATED ART

Decks and similar structures serving as built-up surfaces for walking thereon and/or for supporting other articles, have conventionally been constructed of wood boards or sheet material (pressboard, plywood, etc.). The use of such materials requires additional waterproofing (e.g., tarpaper, etc.) beneath the deck surface, if a truly waterproof deck is required. Moreover, wood is not particularly durable when used as a deck surface or in other areas where considerable wear and tear may occur, and at

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the very least must be treated in some manner (pressure treatment, paint, etc.) in order to resist deterioration due to moisture.

As a result, various manufacturers have developed extruded panels, generally of aluminum or other durable metal but also of plastic, which may be assembled to form a more durable and wear resistant deck assembly. Such decks are particularly useful in the maritime industry, where the deck material is subjected to water and moisture on a nearly constant basis. The aluminum and (to some extent) plastics used in such extruded panels provide a significant improvement in resistance to deterioration when compared to wood.

However, the fact that such panels are somewhat limited in their maximum width due to constraints involved in the extrusion process and shipping results in the need to assemble a series of such extrusions together in order to provide the desired width for most deck installations. While such an assembly can be constructed to form a structurally sound installation, the slight gaps between the assembled panels generally allow rain or other moisture to pass therethrough. Thus, such extruded panels are generally unsuitable for use as a deck or roof surface overlying a room or other area which must be kept dry, unless

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additional waterproofing in the form of an underlying substructure covered with tarpaper, plastic sheeting, or some other waterproof material, is provided. While some attempts have been made to form extrusions which provide a truly waterproof joint, the fact remains that none of the decking extrusions of which the present inventors are aware provide a truly waterproof surface when assembled.

The present invention responds to this need with a series of planks having specialized extruded cross sections which assemble tightly together to substantially eliminate water or other liquid penetration therebetween. Any water or other liquid which does penetrate the tightly interlocked joints of the present decking extrusions is directed to drain channels formed integrally with the extrusions, where the liquid is drained away from the deck. The present watertight decking may be formed in a variety of different configurations, with the interlocking tongue and groove connections of adjoining panels extending from an edge adjacent or opposite the underlying drain channel, positive interlocking means between adjacent panels, different drain channel configurations, and/or additional sealing means, as desired.

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A discussion of the related art of which the present inventors are aware, and its differences and distinctions from the present invention, are provided below.

U.S. Patent No. 4,112,632 issued on September 12, 1978 to Harold G. Simpson, titled "Prefabricated Watertight Structural System," describes a complex roof panel installation having fascia, gutters, and other elements in addition to the roof panels. The panels of the Simpson system are composite, i.e., formed of thin metal sheets covered with a thin layer of Hypalon® plastic. The sheets interlock together, but require additional structure therebelow to provide sufficient support. The Simpson roof panels are so thin and light, that they cannot support the weight of a person thereon by themselves. Simpson does not provide any form of drain channels beneath his roof panels.

U.S. Patent No. 4,266,385 issued on May 12, 1981 to James A. Oehlert, titled "Interlocking Building Panel Construction," describes paneling for roofs or walls comprising thin sheet metal units having interlocking edges. However, the interlocking portions are upstanding when the panels are used for roofing. The raised interlocked edges render the Oehlert panels unsuitable for use as a deck for walking upon. In any

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event, the thin sheet metal from which the Oehlert panels are formed do not provide sufficient structural strength to serve as a deck. While Oehlert does provide channels within the interlocked edges of his panels, they are not waterproof, as fasteners are driven through the floors of the channels to anchor the assembly to the underlying structure.

U.S. Patent No. 4,423,572 issued on January 3, 1984 to Edward S. Tor, titled "Water-Tight Insulated Roof Construction For House," describes another roof assembly formed of a series of interlocking thin sheet metal panels. As in the case of the panels of the Oehlert '385 U.S. Patent, the Tor panels have raised interlocking joints which would preclude their use as a walking surface. Moreover, the thin sheet metal of the Tor panels do not provide sufficient structural strength for walking upon and/or supporting relatively heavy articles, e.g., outdoor furniture, etc., as would normally be found on a deck.

U.S. Patent No. 4,739,599 issued on April 26, 1988 to Serapio E. Lopez et al., titled "Energy Dissipation Structure For Securing Lightweight Roofing Elements," describes a roofing system utilizing a series of relatively thin paving blocks which abut one another. The blocks are secured to the underlying structure by buttons atop the blocks, with springs secured to

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the buttons to hold the blocks down. The blocks do not interlock, nor are their joints waterproof. Some additional waterproofing means (e.g., tarpaper, etc.) must be placed upon the underlying roof structure before the blocks are installed.

U.S. Patent No. 5,050,361 issued on September 24, 1991 to John Hallsten, titled "Deck Structure," describes an assembly of extruded panels for constructing a floating dock or the like. The panels of the Hallsten structure interlock, but no waterproof joints are provided due to their environment as a dock overlying a body of water. Accordingly, Hallsten does not provide any form of drainage channels or gutters beneath the joints of his panels, whereas the present extruded panels include such drainage channels underlying each joint between panels.

U.S. Patent No. 5,647,184 issued on July 15, 1997 to Harry H. Davis, titled "Modular Decking Plank, And Decking Structure," describes a relatively thick extrusion having top and bottom surfaces with a series of webs or ribs therebetween. Each panel has a laterally extending tongue which engages a slot in the adjacent mating panel. The configuration of the panels is such that a gap remains between each of the adjacent panels when they are assembled, and no gutters are provided beneath the gaps.

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Thus, the Davis panels are not at all waterproof and cannot be installed over a room or other space which must remain dry, unless considerable waterproofing (e.g., the installation of tarpaper, etc.) is accomplished beneath the panels.

U.S. Patent No. 5,758,467 issued on June 2, 1998 to S. Clayton Snear et al., titled "Inter-Connectable Modular Deck Member," describes a deck construction formed of a series of extruded panels having configurations much like that of the panels of the Davis '184 U.S. Patent, discussed immediately above. The Snear et al. panels have relatively wide and open gutters or channels disposed between each adjacent panel, rather than underlying the drainage area of the panels, as in the present invention. Moreover, Snear secures his panels to the underlying structure by means of screws or nails driven through the overlapping panel edges forming the floors of the gutters. This construction cannot provide a truly waterproof deck.

U.S. Patent No. 5,765,328 issued on June 16, 1998 to Grant M. Moore, titled "Drainage System For Decks," describes the installation of a series of plastic channels or gutters between the supporting joists of an overlying deck formed of spaced apart wood planks or boards. The plastic channels serve to capture any water and/or debris which passes through the gaps

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between the boards. The overlying deck boards are not extruded panels and do not interlock, nor do they have integral drainage channels or gutters formed therewith, as do the present extrusions.

U.S. Patent No. 5,797,237 issued on August 25, 1998 to Donald R. Finkell, Jr., titled "Flooring System," describes flooring boards having a modified tongue and groove joint system. The base edge of each tongue includes a channel therein, with the distal edge of the mating extension which defines one side of the opposite groove having a lip which engages the channel along the tongue. This construction provides greater security for adjoining boards, but does not provide a completely watertight joint, as provided by the present invention. Also, the Finkell, Jr. flooring system is directed to wood boards; no disclosure is made of any form of extrusion, underlying drainage channels or gutters, or other key features of the present invention.

U.S. Patent No. 5,816,010 issued on October 6, 1998 to James H. Conn, titled "Interconnecting Construction Panels," describes a series of identical extruded panels having interlocking means at their adjoining edges. A first panel edge includes a channel with an overhanging lip extending over the

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channel and forming a trough, with the mating second panel edge having an inverted, U-shaped hook, the free end of which forms a "contact" that is inserted into the trough of the first panel edge, although loosely, since the trough has a greater width than the "contact". The opposite wall of the channel of the first panel extends upwardly to a level even with the underside of the first panel and is used as a fulcrum during assembly of the panels. Thus, when the panels are assembled, there is an interference equal to the panel thickness as the upper edge of the second panel is captured beneath the overhanging channel lip of the first panel, while the underside of the second panel bears against the upper edge of the freestanding channel wall of the first panel.

While the Conn patent shows various shapes for the extreme edge configurations of the second panel, no resilient sealing means are provided by Conn to positively seal the joint against moisture seepage therethrough. The principle of capillary action is well known, with a thin film of water tending to seep or "wick" along a surface in defiance of gravity, particularly over smoothly contoured surfaces such as the rounded edges of the Conn panels. Conn does nothing to prevent this with seals or other means employed by the present invention to form truly

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waterproof panel joints. In fact, due to the very high pressure developed by the edge of the second panel bearing against the underside of the first panel, any resilient sealing means applied between these two contact lines would be quickly worn away.

Moreover, Conn specifies that the joints between his panels are relatively loose, i.e. allow a fair amount of lateral play or motion. The present inventors' experience with the Conn panels shows that this lateral motion, along with the tight interference between adjacent panels, results in squeaks, groans, and other unpleasant noises being produced by the Conn panel joints as the "contact" of the second panel rubs and bears against the underside of the first panel in the trough. In contrast, the edges of the panels of the present invention form a series of variations of the tongue and groove principle, and do not require any other support to form a tight lock with one another. Moreover, this tongue and groove principle allows for the installation of resilient seals therein, if so desired, to provide further sealing against moisture seepage. Also, the present panels include a relatively sharp edged drip rail which is suspended within the channel of the adjoining panel. The sharp edge of the drip rail precludes capillary action or

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"wicking" of moisture around the edge, thereby assuring that any moisture which reaches this point will drop into the underlying channel. The drip rail provides an additional benefit by wedging itself against the opposite channel wall to preclude relative motion between the two joined panels.

U.S. Patent No. 6,158,191 issued on December 12, 2000 to Charles T. Seem, titled "Roof Panel With Plow-Shaped Edge And Related Panel System," describes a series of panels formed of foam plastic core material with a very thin sheet metal upper covering. Such panels cannot support any significant weight and must be supported by some underlying structure, as is clear from the drawings of the Seem roof panel system. Seem depends upon multiple areas of resilient foam material along the edges of adjoining panels, rather than providing for the interlock of adjacent panels and drainage gutters for any residual moisture which may pass through the seals, as in the case of the present watertight decking invention.

U.S. Patent No. 6,199,340 issued on March 13, 2001 to Harry H. Davis, titled "Modular Construction Element," describes a closed box extruded structure with interconnecting edge components. The Davis '340 U.S. Patent is a continuation-in-part of the '184 U.S. Patent to Davis, discussed further above.

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The primary difference between the extrusions of the two Davis patents appears to be the rectangular edges of the extrusion of the later '340 patent, as compared to the trapezoidal edges of the extrusion of the earlier '184 patent discussed further above. The same points raised in the discussion of the earlier '184 U.S. Patent to Davis are seen to apply here as well, particularly insofar as the lack of a completely watertight joint and the need for additional waterproofing for the Davis extrusions is concerned.

U.S. Patent No. 6,324,796 issued on December 4, 2001 to Randall N. Heath, titled "Modular Decking Planks," describes another box structure extrusion having interlocking edges between adjacent panels. A downwardly extending male box structure locks into a mating upwardly facing channel in the adjacent panel, to join two panels together. This is not a completely watertight structure, as water can seep downwardly into the upwardly facing channels, and the channels include nail or other fastener holes in their bottom components. In contrast, the channels of the present extruded panels are unbroken, with fasteners being secured through a flange which extends externally from each channel.

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U.S. Patent No. 6,427,395 issued on August 6, 2002 to Glenn R. Elsasser et al., titled "Elongated Covering Member Of Extruded Plastic Suitable For Flooring, Decking, Seating, And Like Uses," describes various embodiments of an extrusion having opposed channels with open tops along each edge. Fasteners are driven through the floors of the channels, and the channels are covered with a plastic overlay which snaps or catches in place over the base extrusion, or into the channels. The Elsasser et al. extrusions are particularly directed to use as covers for wood stadium seating or the like. Elsasser et al. note that their extrusions may be used for roof decking or the like, but they fail to provide any means of interconnecting adjacent extrusion components to provide any sort of watertight (or other) joint between them. Thus, water and foreign matter can easily pass between adjacent panels of the Elsasser et al. extrusions.

Finally, Japanese Patent Publication No. 6-108,589 published on April 19, 1994, titled "Gutter-Built-In Roof Panel," describes (according to the drawings and English abstract) a composite panel having a series of ribs or support members therein that is overlaid with sheet material. The English abstract refers to "vertical gutters," by which it

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appears that they mean the sloped eaves of a gabled roof. The panels are laterally symmetrical, with no direct tongue-and-groove interconnection, as provided by the present extruded panels.

None of the above inventions and patents, taken either singly or in combination, is seen to describe the instant invention as claimed. Thus watertight decking solving the aforementioned problems is desired.

## SUMMARY OF THE INVENTION

The present invention comprises several embodiments of rigid structural extrusions which form watertight decking when assembled together. The extruded panels of the present invention may be divided into three general types, comprising first side panels, opposite second side panels, and central panels which may be assembled between the first and second side panels. The first side and central panels include gutters formed integrally therewith and either a tongue or a groove formed along the gutter edge for engaging a mating tongue or groove along the adjoining edge of the adjacent panel. The second side and central panels also include mating edges which

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engage the corresponding edges of the adjacent panel along the gutter edge.

The second side and central panels also include depending drip rails, which extend downwardly into the gutter of the adjoining panel. These drip rails serve two functions: (1) they prevent capillary flow or "wicking" of any moisture which seeps through the joints between panels from flowing along the underside of the panel and past the opposite gutter wall to drip into the underlying room or area, and (2) the drip rails are spaced to produce a wedging fit against the gutter wall edge of the adjoining panel, forcing the tongue and groove joint tightly together. The gutter wall against which the drip rail bears is preferably somewhat shorter than the underside of the adjoining panel installed thereover, in order to prevent noise from contact between the gutter wall and the overlying panel when the assembly is walked upon and flexed slightly.

Additional sealing may be provided in the form of a resilient seal disposed within the groove of the tongue and groove joints between the panels, in order to further insure against moisture penetration through the panel assembly. Also, the depending drip rail may have a bead formed along the channel wall contact surface thereof, which engages a groove formed in

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the channel wall. This provides an even more secure assembly for the present panels, locking them together and assuring that they cannot separate from one another. The present panels may be used in the construction of docks and other maritime structures, but are also well suited for deck and similar roof construction due to their rigidity, strength, and resistance to water penetration.

## BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of an assembled series of panels comprising a first embodiment of the watertight decking of the present invention, showing the general configuration of the decking.

Fig. 2 is a broken away, exploded perspective view of the channel edge of a first panel and the mating edge of a second panel, showing assembly of two panels of the Fig. 1 embodiment.

Fig. 3 is an end elevation view in section of two panels of the embodiment of Figs. 1 and 2, showing their fit when assembled together.

Fig. 4 is an end elevation view in section of two panels comprising a second embodiment, having a square or rectangular channel configuration.

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Fig. 5 is an end elevation view in section of two panels comprising a third embodiment, wherein the tongue and groove panel edges are reversed from the first two embodiments.

Similar reference characters denote corresponding features consistently throughout the attached drawings.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention comprises a series of embodiments of rigid, load-bearing, extruded panels which form a watertight deck when assembled together. The panels each include some means of positively locking to one another to form a leakproof seal, and include channels for draining any moisture which might seep through an imperfect seal.

Fig. 1 of the drawings provides a perspective view of a panel assembly formed of a series of first embodiment panels, comprising a first end panel 10, a second end panel 12, and an intermediate panel 14. Each of the panels 10 through 14 includes a generally flat, planar upper surface 16 and an opposite lower or bottom surface 18 (shown in Fig. 3). The upper surface may be provided with ribs 20 (or other raised or recessed pattern) to provide more secure traction when walking on a deck formed of the present panels. The first and second

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end panels 10 and 12 each include finished, flanged outboard edges 22, which are not configured to attach to other panels of the present invention. However, the first end panel 10 and intermediate panel 14 each have first attachment edges which positively interlock with the mating second attachment edges of second end panel 12 and other intermediate panels 14 (not shown).

Figs. 2 and 3 respectively provide exploded perspective and end views in section of a first and second attachment edge, respectively 24 and 26, of the watertight panels of the present invention. In the embodiment of Figs. 1 through 3, the first attachment edge 24 includes a tongue 28 extending therefrom, which engages a mating groove 30 defined by a first or upper lip 32 which is coplanar with its panel and a depending arcuate second or lower lip 34. Upper lip 32 and lower lip 34 may describe about one-half of a parabola or about one-quarter of a circle, ellipse, or other arcuate closed figure when viewed from an end view, as shown in Fig. 3. The tongue 28 preferably has a convex lower curvature 36 to fit closely with the concave arcuate upper surface of the lower lip 34 of the adjoining panel edge 26. The specific arrangement of the tongue and groove

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components may be reversed in this or other embodiments, as desired.

The first attachment edge 24 has a channel first wall 38 depending therefrom, with the channel first wall 38 having an upper or panel attachment edge 40 and an opposite lower edge 42. A channel floor 44, which may be curved to form a generally U-shaped channel as shown in Figs. 1 through 3 or may have a flat, V, or other configuration as desired, extends from a first wall edge 46 from the lower edge 42 of the channel first wall 38, across to an opposite second wall edge 48. A freestanding channel second wall 50 extends from its lower edge 52 which joins with the second wall edge 48 of the channel floor 44. The channel second wall 50 is spaced apart and generally parallel to the channel first wall 38 and extends upwardly to its upper edge 54, which is spaced apart from the channel first wall 38 by the width of the channel floor 44. An attachment flange 56 extends outwardly from the juncture of the second wall edge 48 of the channel floor 44 and the lower edge 52 of the channel second wall 50 and generally coplanar with the channel floor 44, and serves as a plate through which fasteners (nails, screws, etc.) may be driven to secure the present panels to an underlying structure.

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It will be noted that the structure described thus far does not include any independent means (adhesive, etc.) for positively locking the tongue 28 of the first end or intermediate panels 10 and 14 into the groove 30 of an adjoining intermediate panel 14 or second end panel 12. The present extruded decking panels provide for such positive locking through the interlocking shapes of the tongue and groove when flanges 22 and 56 are secured to a supporting structure in order to preclude relative movement between panels, together with the locking means described immediately below.

Figs. 2 and 3 illustrate such positive locking means to preclude relative movement between panels. It will be noted that the second end panel 12 and intermediate panels 14 each have a drip rail 58 extending downwardly from the lower surface 18 thereof, which is spaced apart from the second attachment edges 26 of these panels 12 and 14 by a distance about equal to the span between the two channel walls 38 and 50. The drip rail 58 preferably has an arcuately convex contact surface 60 abutting the channel second wall 50, the arcuate shape of the drip rail 58 producing a cam-like action to smoothly increase the sealing pressure and wedge the groove 30 of the panel second attachment edge 26 tightly against the tongue 28 of the opposite

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panel first attachment edge 24 as the panel second attachment edge 26 is rotated into place along the opposite panel first attachment edge 24. The completed assembly is most clearly shown in Fig. 3 of the drawings. Additional sealing against moisture may be provided by installing a bead of resilient and/or adhesive material 62 within the grooves 30 of the panel second attachment edges 26, to provide an even better seal as shown in Fig. 3.

The primary means for securing each of the present panels together is by the installation of fasteners through the attachment flanges 56 and/or the outboard edge flanges 22, depending upon the specific panel. However, some additional security may be provided by locking the drip rail 58 to the adjacent channel second wall 50 with which it is in contact. This also serves to prevent relative motion and noise between the drip rail 58 and the channel second wall 50 against which the drip rail 58 bears tightly.

It will be noted in Figs. 2 and 3 that a locking groove 64 is provided along the channel second wall 50 on the surface facing the drip rail 58, with a mating locking bead 66 protruding from the channel second wall contact surface 60 of the drip rail 58. The panels are assembled by placing the

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grooved second attachment edge 26 of one panel along the tongue 28 extending from its first attachment edge 24 of a mating panel, and rotating the panel with the second attachment edge 26 downwardly about the pivot line defined by the distal edge of the first or upper lip 32 of the panel second attachment edge 26 where it contacts the base of the tongue 28 of the opposite panel. This rotational motion during the assembly is provided by the arcuate shape of the lower lip 34 of the groove assembly and the closely fitting convex curvature 36 of the tongue 28 of the two mating panels.

As the second panel 12 or 14 is rotated into position with the opposite first panel 10 or 12 of the assembly, the drip rail 58 extends downwardly between the two channel walls 38 and 50 and bears against the inner surface of the channel second wall 50 to wedge the groove 30 of the second panel tightly against the tongue 28 of the first panel, as described further above. The drip rail 58 is locked in place relative to the channel second wall 50 by means of the locking bead 66 of the drip rail 58 snapping into place in the locking groove 64 of the channel second wall 50, to provide a more secure assembly and also to preclude relative movement and resulting noise between the drip rail 58 and the channel second wall 50.

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Fig. 3 illustrates a gap 68 between the upper edge 54 of the channel second wall 50 and the underside 18 of the mating panel, due to the upper edge 54 of the channel second wall being non-coplanar with the lower surface(s) 18 of the panel(s). This allows flexure of the panels to occur when weight is applied thereto, without allowing the panel having the drip rail 58 to flex sufficiently for its lower surface 18 to contact the upper edge 54 of the channel second wall of the opposite panel. The primary benefit of this is to reduce noise in the panel assembly, when weight is applied to the panels. The locking groove 64 of the channel second wall 50 and mating locking bead 66 of the drip rail 58, also assist in precluding relative movement of the overlying panel and the underlying channel second wall 50.

The drip rail 58 provides another benefit, as a last chance stop for any moisture which may seep through a defective seal at the tongue and groove assembly of the first and second attachment edges 24 and 26 of the two joined panels. In other panels, moisture which seeps through such a defective joint will creep along the underside of the panel(s) until it amasses sufficiently to drip from the panel underside. It has been found that a miniscule amount of moisture will flow around a

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rounded contour due to surface tension and capillary action, and flow back up a moisture barrier having smoothly rounded contours. On the other hand, providing the moisture barrier, e.g., the drip rail 58 of the present panel assembly, with a relatively sharp lower edge 70, causes the moisture to gather along that edge 70 and drip into the underlying channel where it can be drained off.

Fig. 4 illustrates a second embodiment of the present watertight decking invention, wherein the channel floor 144 is flat and forms a continuous and unbroken flat plane with the attachment flange 56. The channel walls 38 and 50 and the flat channel floor 144 of the Fig. 4 embodiment thus define a generally rectangular channel shape, rather than the U-shaped channel of the embodiment of Figs. 1 through 3. Other components, e.g. the tongue 28, mating groove 30, drip rail 58 with its locking bead 66 and the mating locking groove 64 of the channel second wall 50, etc., are identical to those components described further above for the first embodiment of Figs. 1 through 3. It has been found that the U-shaped channels of the embodiment of Figs. 1 through 3 (and Fig. 5, discussed below) are somewhat less critical to form during the extrusion process.

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However, the specific channel shape is not critical to the inventive concept of the present watertight decking embodiments.

Fig. 5 provides an illustration of yet another embodiment of the present watertight decking invention. The embodiment of Fig. 5 most closely resembles the embodiment of Figs. 1 through 3 with their rounded channel floors 44, but differs primarily in that the tongue and groove components are reversed from their relative locations in the embodiments of Figs. 1 through 4. In Fig. 5, the tongue 228 extends from the second attachment edge 226 of a second end or intermediate panel, while the mating groove 230 is formed along the first attachment edge 224 of a first end or intermediate panel.

It will be noted that the tongue and groove shapes are somewhat different from those of the first two embodiments of Figs. 1 through 4, as well. In the embodiment of Fig. 5, the upper edge 40 of the channel first wall 38 extends from an arcuately concave socket which forms the groove 230 of the assembly, which in turn extends from a line somewhat back from the first or upper lip 232 extension of the first attachment edge 224 of the first end or intermediate panel to form the lower lip 234 of the groove 230. The panel joint embodiment of Fig. 5 may have other differences from the embodiments of Figs.

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1 through 4 as well, e.g. a different shape for the ribs 220 (or other traction enhancing means) on the upper surface(s) 16, the omission of the locking bead 66 along the channel wall contact face of the drip rail 58 and corresponding omission of the locking groove 64 along the inner surface of the channel wall 50, etc. These various features may be installed or omitted on any of the embodiments of the present watertight decking panels, as desired. Other components of the embodiment of Fig. 5 are essentially identical to those corresponding components of the embodiments of Figs. 1 through 4, and are indicated by the same numbers used to identify those components in the other drawing Figs.

In conclusion, the present watertight decking embodiments provide a positive means of sealing a deck or other surface to prevent the passage of moisture therethrough, without any other steps being required other than assembly of the panels comprising the deck assembly. The present watertight decking may be used in the construction of docks and similar structures where a watertight fit is not necessarily required, but is also well suited for use in constructing roof decks and the like and obviating the need for additional waterproof sheathing beneath the deck panels. While it is anticipated that the present

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watertight decking panels will be primarily formed of aluminum extrusions, other materials, e.g. plastics of various types, may be used as well, if so desired. The thickness and dimensions of such plastic extrusions may be adjusted as required to provide the required durability.

Another advantage of the present decking is the dual benefit provided by the drip rails which depend from the lower surface of the panels. The drip rails extend downwardly into a drainage channel and are positioned to bear tightly against one of the channel walls, thereby wedging the opposite tongue and groove assembly tightly together to preclude relative motion between panels. This tight fit between panels also precludes squeaking or other noise produced when adjoining panels move relative to one another. The drip rails, with their relatively sharp lower edges, also form a barrier to prevent the capillary flow of moisture around the edges, and cause any moisture which has reached that point to gather along the edges and drip into the channel or gutter therebelow where it can be drained off. Accordingly, the present watertight decking will be most useful to building contractors and others who wish to provide a tight and quiet panel assembly through which water cannot pass, and

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which therefore needs no additional sheathing, waterproofing, or additional steps and/or materials during assembly.

It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following claims.

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